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International Notes

Toxic Hypoglycemic Syndrome – Jamaica, 1989–1991

In January and February 1991, the health officer in the parish of St. Ann, Jamaica, received reports of eight persons with toxic hypoglycemic syndrome (THS), an illness associated with consumption of unripe ackee fruit and, possibly, renta yam; two cases were fatal. On July 25, the Jamaican Ministry of Health (JMH) contacted CDC for assistance in investigating the continued occurrence of THS; the collaborative JMH and CDC epidemiologic investigation focused on characterizing the epidemiology of THS in Jamaica and assessing the role of ackee fruit, renta yams, and other factors.

A case of THS was defined as a clinician's diagnosis of hypoglycemia in any person who was examined at eight public hospitals from January 1, 1989, through July 31, 1991, and who had a hospital discharge diagnosis or cause of death listed as Jamaican vomiting sickness, ackee poisoning, renta yam poisoning, or toxic hypoglycemia of unknown etiology. Cases of hypoglycemia associated with insulin use, insulinoma, or Reye syndrome were excluded. Medical records were reviewed at eight public hospitals in six of the 14 parishes in Jamaica; the nutritional status of patients could not be assessed.

The investigation identified 38 patients, including eight who died, who had illnesses meeting the case definition. Reported symptoms included vomiting (77%), coma (26%), and seizures (24%). Seven (18%) patients had laboratory-confirmed hypoglycemia before intravenous glucose treatment was initiated. Of the 38 cases of THS, 28 (74%) (including six deaths) were attributed to ackee poisoning, nine (24%) (including two deaths) to idiopathic toxic hypoglycemia, and one (3%) to renta yam poisoning.

Patients resided in seven parishes. Twenty-one (55%) cases occurred in 1991; of these, eight were in St. Ann parish. Most (29 [76%]) cases occurred during January–March (Figure 1). For the case-finding period, the average annual rate of THS in the seven parishes was 1 per 100,000 persons per year. Twenty-eight (74%) of the patients were aged $<$15 years; the rate of THS was 2 per 100,000 persons per year among those aged $<$15 years, compared with 0.4 per 100,000 persons per year for those aged $\geq$15 years.

Toxic Hypoglycemic Syndrome — Continued

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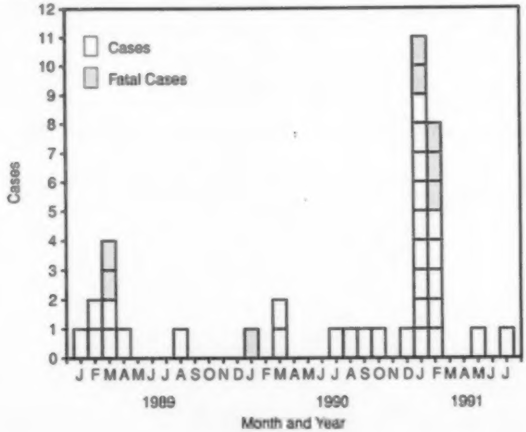
Editorial Note: THS is characterized by acute onset of profuse vomiting, convulsions, coma, and sometimes death. Profound hypoglycemia (blood glucose levels as low as 3 mg/dL [*1*]) is observed in most cases. This problem is endemic in Jamaica, with 271 cases reported to the JMH since 1980.

An association between ackee poisoning and Jamaican vomiting sickness was first noted in 1875 and documented in 1904 (*2*). Ackee, the national fruit of Jamaica, is a food staple in many Jamaican diets. The ackee tree was imported from West Africa to Jamaica in 1778; ubiquitous in Jamaica, it is also found in the Antilles, Central America, and southern Florida (*2*). In Jamaica, fresh ackee are consumed directly following harvesting or can be obtained in markets when in season (December–March) (*3*). Canned ackee fruit is available throughout the year.

Unripe ackee contains hypoglycin A, a water-soluble liver toxin that induces hypoglycemia by inhibiting gluconeogenesis secondary to its limiting of cofactors (CoA and carnitine) essential for oxidation of long-chain fatty acids (*1,4*). Potential risk behaviors for ackee poisoning include 1) selection and cooking of unripe ackee; 2) purchase of tampered, forcibly opened ackee; and 3) reuse of the water in which unripe ackee has been cooked (*3*). Undernutrition is also thought to be associated with both susceptibility to and severity of THS, particularly among children in Jamaica (*2*).

In Jamaica, the epidemiology of ackee poisoning has not been well characterized, and the true incidence and mortality are believed to be underreported. In this investigation, retrospective case-finding of ackee poisoning using an explicit case definition identified 38 cases in the eight hospitals—32 more than had been reported

FIGURE 1. Cases of toxic hypoglycemic syndrome, by month and year — Jamaica, January 1989–July 1991



Toxic Hypoglycemic Syndrome — Continued

to the JMH through routine surveillance for the same period. Because of this underreporting, determining whether an outbreak occurred or whether the eight cases of THS in the parish of St. Ann were associated with a specific event is not possible. In addition, because the medical officers in St. Ann had a special interest in THS, surveillance for this problem may have been heightened in the parish.

The JMH is reviewing the feasibility of introducing enhanced passive surveillance of THS. In addition, through public health inspectors, the JMH continues to monitor ackee fruit that is either sold fresh or canned. No cases of THS are known to have been reported among persons from the United States visiting Jamaica, nor have cases been reported in the United States.

References

1. Tanaka K, Kean EA, Johnson B. Jamaican vomiting sickness. N Engl J Med 1976;295:461–7.
2. Hill KR. The vomiting sickness of Jamaica: a review. West Indian Med J 1952;1:243–64.
3. Ashcroft MT. Some noninfective diseases endemic in the West Indies. Trop Geogr Med 1978;30:5–21.
4. Bressler R. The unripe ackee—forbidden fruit. N Engl J Med 1976;295:500–1.

Effectiveness in Disease and Injury Prevention

Worksite and Community Health Promotion/ Risk Reduction Project — Virginia, 1987–1991

Because cardiovascular disease (CVD) is a leading cause of premature disability and death in the United States (*1*), approaches are needed to prevent this problem at the community level. In the Mount Rogers Health District (MRHD) (1990 population: 178,000), a six-county area in southwestern Virginia, age-adjusted death rates for CVD substantially exceed state and national averages (Table 1). In August 1987, the MRHD implemented the Worksite and Community Health Promotion/Risk Reduction Project to help residents of this large, rural area improve their health by adopting healthy lifestyles and, consequently, reduce their risks for CVD and cancer. This report summarizes activities associated with the project and changes in health indicators for participants from April 1989 through May 1990.

The project—a collaborative effort involving state and local governments, community groups, and businesses—focused on reducing risk factors associated with CVD and cancer among employees at their worksites and residents in the community. This

TABLE 1. Age-adjusted death rates* for four leading causes of death — Mount Rogers (Virginia) Health District, Virginia, and United States, 1987

Cause of death	Mount Rogers†	Virginia†	United States§
Heart disease	376.3	272.2	312.4
Malignant neoplasm	189.2	183.7	195.9
Cerebrovascular disease	91.7	58.5	61.6
Unintentional injuries	44.0	39.2	39.0

*Per 100,000 persons.
†Source: Virginia Department of Health. 1987 Virginia vital statistics annual report. Richmond, Virginia: Virginia Department of Health, 1988:113–4.
§Source: NCHS. Vital statistics of the United States, 1987. Vol 2, part A. Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1990; DHHS publication no. (PHS)90-1101.

Health Promotion — Continued

project was coordinated by three paid, full-time staff members who directed efforts toward approximately 6000 persons at intervention sites including senior citizen facilities (27), health department clinics (23), schools (22), churches (19), businesses (15), civic group meetings (nine), and health fairs (seven). Volunteers who had been trained in planning and developing individualized worksite programs provided technical assistance. The staff developed two documents—a manual for organizing worksite health promotion programs and a community resource guide for worksite wellness—to foster a longstanding commitment to comprehensive employee health programs.

A CDC health-risk appraisal survey (*2*) that had been administered in 1990 at worksites and screening events indicated that, of the 6306 persons surveyed, 3909 (62%) persons did not exercise regularly*; 3342 (53%) were overweight†; 3216 (51%) had never had their cholesterol levels checked; 2017 (32%) were smokers§; and 1261 (20%) knew they were hypertensive. In addition to its rural location, this community was characterized by low median family income ($14,604 annually), limited medical services, education levels below the state average, and unemployment levels higher than the state average—all factors underscoring the need for intensified health promotion and risk reduction efforts.

Activities designed to provide positive reinforcement for prevention-oriented health practices included educational presentations and group discussions, health fairs and screenings, individual counseling, and radio and television public service announcements. Screenings by the MRHD staff included evaluations for cholesterol, hypertension, overweight, smoking, and exercise; counseling services included follow-up contact and referrals for persons at risk for CVD and cancer.

Follow-up data collected from 424 employees of the Smyth County School System (the group for which the most comprehensive data had been collected) 2 years after they joined the wellness program indicated that 93% of the school system employees had participated in at least one segment of the school-based health promotion program; 86% self-reported they had increased their health awareness; 40% had increased their levels of regular physical activity; and 30% reduced their intake of high-fat foods. Moreover, 44% of smokers attempted to quit within 9 months after joining the program; 32% of the overweight employees lost weight. Total average serum cholesterol levels declined from 237 mg/dL to 203 mg/dL during a 6-month period.¶ From August 1989 to August 1990, school employee health insurance claims decreased 20%.

During 1989, second-year program efforts emphasized cancer awareness in addition to cardiovascular risk reduction. Approximately 115 women used the program's mobile mammography service; based on the mammography findings, seven asymptomatic women received further prompt medical evaluation.

The MRHD's health screenings and educational programs also helped to promote policy changes. For example, one company established a policy to reduce exposure

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*Any type of exercise performed for at least 20 minutes, two or more times a week.

†Weighing 20% more than ideal body weight (*3*).

§Current smokers at the time of the appraisal.

¶In measuring cholesterol levels, the staff used the Boehringer Mannhein Reflotron and followed standards set by the Virginia Department of Health. Use of trade names is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

Health Promotion — Continued

of nonsmokers to environmental tobacco smoke (i.e., the cafeteria was divided into smoking and nonsmoking areas; smoking was not allowed elsewhere in the building), received assistance from the MRHD to select a new food vendor, and hired another company to instruct the vendor in the preparation of low-fat, low-cholesterol, and low-sodium foods for employees. In addition, school cafeteria managers in Smyth County consulted with registered dietitians at MRHD regarding healthier menu selections.

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Editorial Note: At least two elements may have contributed to the successful implementation of the MRHD Worksite and Community Health Promotion/Risk Reduction Project. First, the project was supported by the superintendent of Smyth County Schools, who enabled the in-kind services of a school nurse for organizing the worksite volunteer leaders. Second, a variety of incentives (e.g., quickly earned rewards) and a points system may have motivated and reinforced positive health behaviors and helped participants set wellness goals. However, because this project was not designed as a community intervention trial with controls, the findings cannot be generalized.

The Mount Rogers health promotion programs had five key factors: 1) they addressed the specific health needs and interests of persons, industries, businesses, schools, and community groups; 2) they gave employees a sense of ownership of the program by soliciting and applying their feedback; 3) they were flexible and could be replicated in a variety of settings; 4) they increased the visibility of community resources; and 5) they strengthened working relations between the state and local health departments, businesses, and the community.

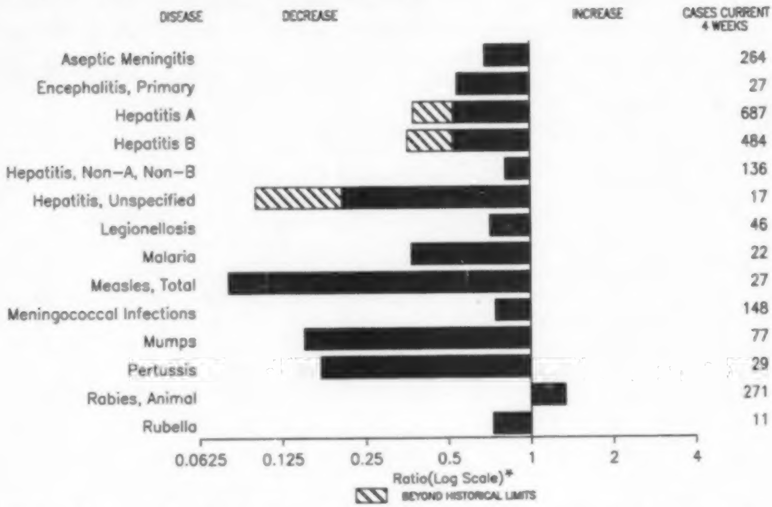
Based on the Mount Rogers project, the General Assembly in Virginia implemented resolutions requiring local health departments to assess the availability of worksite health promotion activities in their areas. The MRHD has received additional state funding to continue its programs. In addition, in recognition of its contribution to community health promotion, the Worksite and Community Health Promotion/Risk Reduction Project received the 1990 Secretary's Community Health Promotion Award for Excellence from the U.S. Department of Health and Human Services.

Additional information about the Mount Rogers project is available from Dr. Craig Smith, MRHD Health Director, 645 Park Boulevard, Suite 200, Marion, VA 24354; telephone (703) 783-9060.

References

1. Public Health Service. Healthy people 2000: national health promotion and disease prevention objectives—full report, with commentary. Washington, DC: US Department of Health and Human Services, Public Health Service, 1991; DHHS publication no. (PHS)91-50212.
2. CDC. Health risk appraisal—United States. MMWR 1981;30:133–5.
3. Metropolitan Life Insurance Company. New weight standards for men and women. State Bulletin of the New York Metropolitan Life Insurance Company 1959;40:1–4.

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending January 25, 1992, with historical data — United States



*Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending January 25, 1992 (4th Week)

	Cum. 1992		Cum. 1992
AIDS	3,341	Measles: imported	-
Anthrax	-	indigenous	27
Botulism: Foodborne	-	Plague	-
Infant	1	Poliomyelitis, Paralytic*	-
Other	-	Psittacosis	5
Brucellosis	2	Rabies, human	-
Cholera	-	Syphilis, primary & secondary	2,214
Congenital rubella syndrome	-	Syphilis, congenital, age < 1 year	-
Diphtheria	-	Tetanus	2
Encephalitis, post-infectious	3	Toxic shock syndrome	14
Gonorrhea	33,603	Trichinosis	1
Haemophilus influenzae (invasive disease)	89	Tuberculosis	1,194
Hansen Disease	1	Tularemia	7
Leptospirosis	1	Typhoid fever	8
Lyme Disease	116	Typhus fever, tickborne (RMSF)	6

*Nine suspected cases of poliomyelitis have been reported in 1991; 4 of the 8 suspected cases in 1990 were confirmed, and all were vaccine associated.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending January 25, 1992, and January 26, 1991 (4th Week)

Reporting Area	AIDS	Aseptic Menin-gitis	Encephalitis		Gonorrhea		Hepatitis (Viral), by type				Legionel-losis	Lyme Disease
			Primary	Post-in-fectious			A	B	NA,NB	Unspeci-fied		
	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1991	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1992
UNITED STATES	3,341	320	31	3	33,603	39,309	882	655	192	22	57	116
NEW ENGLAND	25	51	3	-	765	1,564	33	44	4	5	8	20
Maine	6	4	-	-	1	5	5	-	-	-	2	-
N.H.	6	1	-	-	-	25	4	5	-	-	1	3
Vt.	-	1	2	-	1	8	-	1	1	-	-	-
Mass.	2	11	1	-	332	506	18	33	3	5	4	2
R.I.	10	34	-	-	74	61	5	5	-	-	1	15
Conn.	1	-	-	-	357	959	1	-	-	-	-	-
MID. ATLANTIC	693	14	-	-	1,550	4,519	48	62	4	-	5	61
Upstate N.Y.	56	-	-	-	-	599	-	-	-	-	-	-
N.Y. City	366	5	-	-	333	1,139	14	1	-	-	1	-
N.J.	170	-	-	-	350	646	1	4	2	-	-	3
Pa.	101	9	-	-	867	2,135	33	57	2	-	4	58
E.N. CENTRAL	229	59	7	-	5,987	5,718	116	137	15	2	17	9
Ohio	34	17	3	-	2,376	-	49	24	13	-	11	8
Ind.	32	13	-	-	655	1,013	50	67	-	1	2	1
Ill.	143	-	-	-	2,417	2,320	-	-	-	-	-	-
Mich.	11	29	4	-	441	1,830	12	41	1	1	4	-
Wis.	9	-	-	-	98	555	5	5	1	-	-	-
W.N. CENTRAL	189	19	2	-	1,745	1,927	63	10	-	-	1	1
Minn.	26	1	-	-	176	173	2	2	-	-	-	-
Iowa	13	7	-	-	122	139	2	3	-	-	1	1
Mo.	87	-	-	-	1,102	1,112	-	-	-	-	-	-
N. Dak.	-	1	-	-	-	2	1	-	-	-	-	-
S. Dak.	-	1	-	-	11	24	40	-	-	-	-	-
Nebr.	4	1	-	-	33	200	7	1	-	-	-	-
Kans.	59	8	2	-	301	277	11	4	-	-	-	-
S. ATLANTIC	872	58	7	2	12,793	14,077	45	97	16	4	10	9
Del.	7	5	2	-	99	121	-	5	-	-	-	2
Md.	231	13	-	-	1,311	1,555	11	26	2	3	2	1
D.C.	52	-	-	-	599	862	1	2	-	-	-	-
Va.	18	11	2	1	1,339	1,198	7	11	2	1	1	5
W. Va.	8	-	-	-	86	115	1	3	-	-	-	-
N.C.	50	11	3	-	1,359	2,916	4	23	9	-	1	-
S.C.	26	2	-	-	915	1,329	5	4	-	-	6	-
Ga.	111	9	-	-	5,574	3,350	6	8	-	-	-	-
Fla.	389	7	-	1	1,511	2,631	10	15	3	-	-	1
E.S. CENTRAL	102	31	-	-	2,836	3,431	13	67	118	-	5	1
Ky.	2	17	-	-	346	381	4	6	-	-	2	-
Tenn.	14	8	-	-	1,024	1,126	6	51	114	-	3	1
Ala.	84	6	-	-	533	1,132	3	10	4	-	-	-
Miss.	2	-	-	-	933	792	-	-	-	-	-	-
W.S. CENTRAL	270	4	-	-	3,532	3,340	32	21	3	1	-	2
Ark.	14	4	-	-	1	397	9	9	-	-	-	1
La.	35	-	-	-	624	750	-	-	-	-	-	-
Okla.	41	-	-	-	300	426	23	12	3	1	-	1
Tex.	180	-	-	-	2,607	1,767	-	-	-	-	-	-
MOUNTAIN	94	8	-	-	787	910	133	32	6	2	2	-
Mont.	1	-	-	-	7	5	4	3	-	-	-	-
Idaho	-	-	-	-	5	6	4	7	-	-	-	-
Wyo.	-	-	-	-	3	4	-	1	3	-	-	-
Colo.	39	1	-	-	213	258	21	4	2	2	-	-
N. Mex.	11	1	-	-	71	63	10	6	-	-	-	-
Ariz.	21	6	-	-	346	406	88	8	1	-	2	-
Utah	1	-	-	-	5	30	1	-	-	-	-	-
Nev.	21	-	-	-	137	138	5	3	-	-	-	-
PACIFIC	867	76	12	1	3,608	3,823	399	185	26	8	9	13
Wash.	3	-	-	-	314	420	12	16	3	-	3	-
Oreg.	27	-	-	-	104	164	22	15	5	-	-	-
Calif.	823	71	10	1	3,079	3,097	357	154	18	8	6	13
Alaska	-	1	2	-	72	75	-	-	-	-	-	-
Hawaii	14	4	-	-	39	67	8	-	-	-	-	-
Guam	-	-	-	-	12	-	1	-	-	2	-	-
P.R.	-	2	-	-	1	15	-	1	-	-	-	-
V.I.	1	-	-	-	6	28	-	1	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	2	-	-	-	-	-	-

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending January 25, 1992, and January 26, 1991 (4th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1992	1992	Cum. 1992	1992	Cum. 1992	Cum. 1991	Cum. 1992	1992	Cum. 1992	1992	Cum. 1992	Cum. 1991	1992	Cum. 1992	Cum. 1991
UNITED STATES	34	23	27	-	-	268	176	26	95	14	41	131	1	12	34
NEW ENGLAND	1	-	-	-	-	1	12	-	-	-	-	8	-	4	-
Maine	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
N.H.	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-
Vt.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Mass.	1	-	-	-	-	-	6	-	-	-	-	-	-	-	-
R.I.	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
Conn.	-	-	-	-	-	1	3	-	-	-	-	-	-	-	-
MID. ATLANTIC	4	1	1	-	-	165	5	5	5	2	2	22	-	-	-
Upstate N.Y.	-	U	-	U	-	-	-	U	-	U	-	7	U	-	-
N.Y. City	1	-	-	-	-	6	2	-	-	-	-	-	-	-	-
N.J.	1	-	-	-	-	46	-	-	-	-	-	1	-	-	-
Pa.	2	1	1	-	-	113	3	5	5	2	2	14	-	-	-
E.N. CENTRAL	1	-	-	-	-	3	36	-	9	1	11	33	-	1	1
Ohio	-	-	-	-	-	-	6	-	5	-	-	5	-	-	-
Ind.	-	-	-	-	-	-	8	-	1	-	9	9	-	-	1
Ill.	-	-	-	-	-	1	12	-	1	-	-	12	-	1	-
Mich.	-	-	-	-	-	1	10	-	2	1	2	3	-	-	-
Wis.	1	-	-	-	-	1	-	-	-	-	-	4	-	-	-
W.N. CENTRAL	2	-	-	-	-	-	12	-	1	2	2	15	1	1	2
Minn.	-	-	-	-	-	-	1	-	-	-	-	8	-	-	1
Iowa	1	-	-	-	-	-	1	-	1	1	1	3	-	-	-
Mo.	-	-	-	-	-	-	-	-	-	-	-	2	-	-	1
N. Dak.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Dak.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Nebr.	-	-	-	-	-	-	2	-	-	1	1	1	-	-	-
Kans.	1	-	-	-	-	-	8	-	-	-	-	-	1	1	-
S. ATLANTIC	5	4	4	-	-	2	33	15	41	-	6	5	-	-	-
Del.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Md.	2	-	-	-	-	-	2	1	10	-	6	-	-	-	-
D.C.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Va.	-	-	-	-	-	-	3	-	3	-	-	1	-	-	-
W. Va.	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
N.C.	-	-	-	-	-	-	9	-	-	-	-	4	-	-	-
S.C.	-	-	-	-	-	-	3	1	4	-	-	-	-	-	-
Ga.	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-
Fla.	1	4	4	-	-	2	9	13	24	-	-	-	-	-	-
E.S. CENTRAL	1	15	18	-	-	-	14	-	3	-	3	3	-	-	-
Ky.	-	15	18	-	-	-	8	-	-	-	-	-	-	-	-
Tenn.	1	-	-	-	-	-	2	-	-	-	-	2	-	-	-
Ala.	-	-	-	-	-	-	4	-	3	-	3	1	-	-	-
Miss.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W.S. CENTRAL	-	-	-	-	-	4	9	1	3	2	2	6	-	-	-
Ark.	-	-	-	-	-	4	4	1	3	2	2	-	-	-	-
La.	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-
Okla.	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-
Tex.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOUNTAIN	4	-	-	-	-	13	10	1	11	2	5	13	-	-	1
Mont.	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Idaho	-	-	-	-	-	-	2	1	1	1	3	-	-	-	-
Wyo.	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
Colo.	2	-	-	-	-	-	2	-	2	-	1	3	-	-	-
N. Mex.	1	-	-	-	-	7	-	N	N	1	1	3	-	-	-
Ariz.	1	-	-	-	-	1	1	-	6	-	-	5	-	-	-
Utah	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nev.	-	U	-	U	-	5	3	U	2	U	-	-	U	-	1
PACIFIC	16	3	4	-	-	80	45	4	22	5	10	26	-	6	30
Wash.	2	-	-	-	-	-	5	-	2	-	-	-	-	-	-
Oreg.	1	-	1	-	-	-	11	N	N	1	2	4	-	-	-
Calif.	11	3	3	-	-	80	25	3	19	2	6	12	-	4	30
Alaska	-	-	-	-	-	-	2	-	-	-	-	2	-	-	-
Hawaii	2	-	-	-	-	-	2	1	1	2	2	8	-	2	-
Guam	-	U	-	U	-	-	-	U	1	U	-	-	U	-	-
P.R.	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-
V.I.	-	-	-	-	-	-	-	1	3	-	-	-	-	-	-
Amer. Samoa	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable †International §Out-of-state

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending January 25, 1992, and January 26, 1991 (4th Week)

Reporting Area	Syphilis (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1992	Cum. 1991	Cum. 1992	Cum. 1992	Cum. 1991	Cum. 1992	Cum. 1992	Cum. 1992	Cum. 1992
UNITED STATES	2,214	2,928	14	1,194	1,170	7	8	6	328
NEW ENGLAND	39	80	3	96	44	-	-	-	33
Maine	-	-	-	16	16	-	-	-	-
N.H.	-	-	2	-	-	-	-	-	-
Vt.	-	1	-	-	-	-	-	-	-
Mass.	16	42	1	80	8	-	-	-	-
R.I.	2	2	-	-	6	-	-	-	-
Conn.	21	35	-	-	14	-	-	-	33
MID. ATLANTIC	305	659	2	210	248	-	1	-	57
Upstate N.Y.	-	22	-	-	14	-	-	-	-
N.Y. City	186	291	-	177	180	-	-	-	-
N.J.	19	87	-	4	42	-	1	-	40
Pa.	100	259	2	29	12	-	-	-	17
E.N. CENTRAL	303	278	3	66	119	-	1	-	7
Ohio	51	8	1	11	46	-	1	-	-
Ind.	22	7	1	7	1	-	-	-	-
Ill.	149	194	-	35	63	-	-	-	1
Mich.	66	24	1	8	-	-	-	-	-
Wis.	15	45	-	5	9	-	-	-	6
W.N. CENTRAL	62	42	1	18	27	-	-	-	55
Minn.	5	7	1	7	-	-	-	-	24
Iowa	1	2	-	3	8	-	-	-	9
Mo.	55	33	-	8	12	-	-	-	-
N. Dak.	-	-	-	-	3	-	-	-	5
S. Dak.	-	-	-	-	1	-	-	-	-
Nebr.	1	-	-	-	1	-	-	-	-
Kans.	-	-	-	-	2	-	-	-	17
S. ATLANTIC	793	872	1	148	123	2	1	3	110
Del.	7	8	-	1	3	-	-	-	15
Md.	233	97	-	35	14	2	-	-	43
D.C.	58	50	-	7	11	-	1	-	3
Va.	52	68	-	8	7	-	-	-	7
W. Va.	3	1	-	5	6	-	-	-	3
N.C.	130	115	1	6	37	-	-	3	-
S.C.	88	111	-	17	18	-	-	-	6
Ga.	155	201	-	10	17	-	-	-	33
Fla.	67	221	-	59	10	-	-	-	-
E.S. CENTRAL	312	315	-	42	69	2	-	-	4
Ky.	11	5	-	14	13	1	-	-	2
Tenn.	64	162	-	-	-	1	-	-	-
Ala.	127	80	-	24	35	-	-	-	2
Miss.	110	68	-	4	21	-	-	-	-
W.S. CENTRAL	311	341	-	-	55	3	-	3	30
Ark.	-	19	-	-	9	1	-	2	3
La.	114	120	-	-	-	-	-	-	-
Okla.	13	11	-	-	2	2	-	1	27
Tex.	184	191	-	-	44	-	-	-	-
MOUNTAIN	54	59	2	18	44	-	-	-	6
Mont.	-	-	-	-	-	-	-	-	1
Idaho	1	-	-	2	-	-	-	-	-
Wyo.	-	1	-	-	-	-	-	-	4
Colo.	9	8	1	-	6	-	-	-	-
N. Mex.	2	3	-	-	-	-	-	-	-
Ariz.	21	47	1	12	27	-	-	-	1
Utah	-	-	-	-	10	-	-	-	-
Nev.	21	-	-	4	1	-	-	-	-
PACIFIC	35	282	2	596	441	-	5	-	26
Wash.	-	16	-	17	11	-	-	-	-
Oreg.	4	3	-	5	6	-	-	-	-
Calif.	31	262	2	570	408	-	5	-	26
Alaska	-	1	-	-	2	-	-	-	-
Hawaii	-	-	-	4	14	-	-	-	-
Guam	1	-	-	-	-	-	-	-	-
P.R.	7	12	-	-	-	-	-	-	1
V.I.	4	5	-	1	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	4	-	-	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending January 25, 1992 (4th Week)

Reporting Area	All Causes, By Age (Years): All Ages	>65	45-64	25-44	1-24	<1	P&I† Total
NEW ENGLAND	706	511	116	51	13	15	73
Boston, Mass.	219	148	41	15	3	12	25
Bridgeport, Conn.	48	38	4	4	2	-	2
Cambridge, Mass.	25	23	1	1	-	-	4
Fall River, Mass.	32	30	1	1	-	-	5
Hartford, Conn.	57	41	9	6	1	-	4
Lowell, Mass.	26	19	7	-	-	-	2
Lynn, Mass.	11	7	2	1	1	-	2
New Bedford, Mass.	29	20	8	1	-	-	2
New Haven, Conn.	32	19	5	3	3	2	3
Providence, R.I.	55	40	10	4	1	-	11
Somerville, Mass.	8	5	3	-	-	-	-
Springfield, Mass.	51	36	9	6	-	-	4
Waterbury, Conn.	44	35	7	2	-	-	2
Worcester, Mass.	69	50	9	7	2	1	7
MID. ATLANTIC	2,836	1,890	508	318	48	72	180
Albany, N.Y.	57	43	7	4	-	3	9
Allentown, Pa.	11	10	1	-	-	-	1
Buffalo, N.Y.	100	70	20	6	1	3	6
Camden, N.J.	43	25	9	4	4	1	3
Elizabeth, N.J.	31	20	4	7	-	-	2
Erie, Pa.§	47	37	6	3	-	1	4
Jersey City, N.J.	75	50	15	8	1	1	1
New York City, N.Y.	1,492	957	265	205	30	35	78
Newark, N.J.	84	39	23	13	1	8	7
Paterson, N.J.	36	25	6	3	2	-	3
Philadelphia, Pa.	398	272	76	35	5	10	33
Pittsburgh, Pa.§	66	46	10	6	2	2	4
Reading, Pa.	47	29	11	6	-	1	9
Rochester, N.Y.	125	96	16	7	1	5	5
Schenectady, N.Y.	26	19	6	1	-	-	-
Scranton, Pa.§	33	28	3	2	-	-	2
Syracuse, N.Y.	65	51	9	3	1	1	8
Trenton, N.J.	39	24	10	5	-	-	2
Utica, N.Y.	28	21	7	-	-	-	-
Yonkers, N.Y.	33	28	4	-	-	1	3
E.N. CENTRAL	2,424	1,575	455	217	101	75	160
Akron, Ohio	53	44	3	3	-	3	3
Canton, Ohio	43	38	2	2	1	-	7
Chicago, Ill.	409	192	80	81	48	8	22
Cincinnati, Ohio	104	72	22	3	2	5	10
Cleveland, Ohio	181	121	31	19	5	5	4
Columbus, Ohio	209	122	49	22	8	8	13
Dayton, Ohio	137	91	35	4	5	2	10
Detroit, Mich.	321	180	76	31	13	20	10
Evansville, Ind.	49	41	4	1	-	3	4
Fort Wayne, Ind.	79	67	9	1	2	-	6
Gary, Ind.	23	12	7	2	-	2	2
Grand Rapids, Mich.	75	51	15	8	-	1	11
Indianapolis, Ind.	217	149	40	18	7	3	18
Madison, Wis.	37	26	6	1	2	2	3
Milwaukee, Wis.	138	105	18	11	2	2	18
Peoria, Ill.	51	42	7	1	1	-	5
Rockford, Ill.	45	30	6	3	2	4	3
South Bend, Ind.	46	39	7	-	-	-	-
Toledo, Ohio	145	107	26	5	2	5	11
Youngstown, Ohio	62	46	12	1	1	2	-
W.N. CENTRAL	872	632	149	46	20	25	60
Des Moines, Iowa	46	32	11	1	-	2	1
Duluth, Minn.	28	24	2	2	-	-	1
Kansas City, Kans.	63	48	12	2	1	-	5
Kansas City, Mo.	123	86	22	7	4	4	5
Lincoln, Nebr.	63	52	8	2	-	1	9
Minneapolis, Minn.	228	165	35	15	6	7	24
Omaha, Nebr.	85	52	19	8	3	3	4
St. Louis, Mo.	132	99	21	5	4	3	-
St. Paul, Minn.	45	33	8	2	-	2	6
Wichita, Kans.	59	41	11	2	2	3	5
S. ATLANTIC	1,407	897	282	151	43	28	100
Atlanta, Ga.	168	111	27	17	3	10	7
Baltimore, Md.	162	107	27	19	6	3	19
Charlotte, N.C.	103	72	21	7	3	-	9
Jacksonville, Fla.	144	100	23	11	6	4	18
Miami, Fla.	109	70	26	11	2	-	-
Norfolk, Va.	68	36	15	7	6	4	5
Richmond, Va.	90	52	17	15	4	2	4
Savannah, Ga.	75	46	17	8	2	2	12
St. Petersburg, Fla.	86	65	13	7	-	1	-
Tampa, Fla.	168	106	34	23	3	1	17
Washington, D.C.	199	105	57	25	7	-	9
Wilmington, Del.	35	27	5	1	1	1	-
E.S. CENTRAL	929	612	186	69	26	36	65
Birmingham, Ala.	138	88	29	10	5	6	4
Chattanooga, Tenn.	71	52	13	3	1	2	6
Knoxville, Tenn.	106	68	28	4	5	1	9
Louisville, Ky.	56	33	12	6	1	4	3
Memphis, Tenn.	285	181	59	20	10	15	21
Mobile, Ala.	81	57	13	7	1	3	8
Montgomery, Ala.	63	48	7	7	-	1	-
Nashville, Tenn.	129	85	25	12	3	4	14
W.S. CENTRAL	1,580	975	319	188	48	50	121
Austin, Tex.	82	49	15	10	6	2	9
Baton Rouge, La.	53	37	7	7	1	1	2
Corpus Christi, Tex.	60	36	13	5	4	2	8
Dallas, Tex.	319	184	73	33	12	17	15
El Paso, Tex.	73	48	17	4	1	3	4
Ft. Worth, Tex.	120	67	29	18	4	2	7
Houston, Tex.	336	199	70	49	7	11	35
Little Rock, Ark.	89	65	12	8	2	2	7
New Orleans, La.	66	30	13	19	4	-	-
San Antonio, Tex.	223	152	41	22	3	5	20
Shreveport, La.	70	50	13	4	2	1	7
Tulsa, Okla.	89	58	16	9	2	4	7
MOUNTAIN	782	571	108	62	25	16	72
Albuquerque, N.M.	97	66	16	7	4	4	9
Colo. Springs, Colo.	47	37	4	4	2	-	4
Denver, Colo.	107	79	13	5	6	4	16
Las Vegas, Nev.	191	125	42	18	4	2	7
Ogden, Utah	29	22	4	1	1	1	4
Phoenix, Ariz.	130	101	6	16	2	5	6
Pueblo, Colo.	27	24	1	2	-	-	4
Salt Lake City, Utah	38	28	4	2	4	-	10
Tucson, Ariz.	116	89	18	7	2	-	12
PACIFIC	1,819	1,280	299	149	50	31	164
Berkeley, Calif.	19	17	-	1	1	-	1
Fresno, Calif.	106	79	18	6	2	1	14
Glendale, Calif.	27	25	1	1	-	-	2
Honolulu, Hawaii	74	56	6	9	1	2	4
Long Beach, Calif.	114	77	16	10	7	4	16
Los Angeles, Calif.	486	313	85	52	20	6	25
Pasadena, Calif.	43	37	5	-	-	1	6
Portland, Oreg.	86	66	15	1	2	2	8
Sacramento, Calif.	163	126	23	9	5	-	26
San Diego, Calif.	166	112	29	18	2	5	16
San Francisco, Calif.	U	U	U	U	U	U	U
San Jose, Calif.	201	135	39	20	4	3	24
Santa Cruz, Calif.	28	21	4	2	1	-	6
Seattle, Wash.	154	109	29	11	4	1	4
Spokane, Wash.	63	43	12	5	1	2	5
Tacoma, Wash.	89	64	17	4	-	4	7
TOTAL	13,355¶	8,943	2,422	1,251	374	348	995

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

†Pneumonia and influenza.

§Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

¶Total includes unknown ages.

U: Unavailable

Current Trends

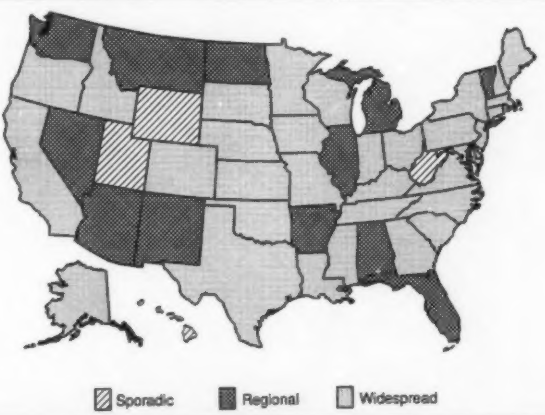
Update: Influenza Activity — United States, 1991–92 Season

From October 23, 1991, through January 18, 1992, 46 state health departments reported regional or widespread influenza activity for 1 or more weeks (Figure 1). For the week ending January 4, 34 states reported regional or widespread activity, the most during any single week this season. From late October through mid-December, influenza outbreaks reported from 11 states involved primarily school children (*1*). Reports of outbreaks among adults began in mid-November and continued through January and involved persons in a variety of settings (e.g., a business in California; a hospital in Ohio; a county jail in Tennessee; and nursing homes in Maryland, Missouri, New York, Ohio, Utah, and Wisconsin).

Based on CDC's 121-city mortality reporting system, for the week ending January 18, 7.9% of reported deaths were associated with pneumonia and influenza— substantially exceeding the baseline level of 6.4% for that week. In addition, the week ending January 18 was the fourth consecutive week this index of influenza activity substantially exceeded baseline levels (Figure 2).

World Health Organization (WHO) collaborating laboratories in the United States identified more than 99% of all isolates as influenza A; 82% of all subtyped isolates were influenza A(H3N2). The proportion of influenza A(H1N1) viruses among subtyped isolates varied both regionally and temporally. Overall, from November 9 through January 18, A(H1N1) isolates increased from 8% to 18% of all influenza A isolates subtyped. Regionally, the proportion of subtyped influenza A isolates that were influenza A(H1N1) varied widely, ranging from 0 and 3%, respectively, in the East South Central and East North Central regions to 37% and 58%, respectively, in the Middle Atlantic and South Atlantic regions.

FIGURE 1. Influenza activity* — United States, 1991–92 season



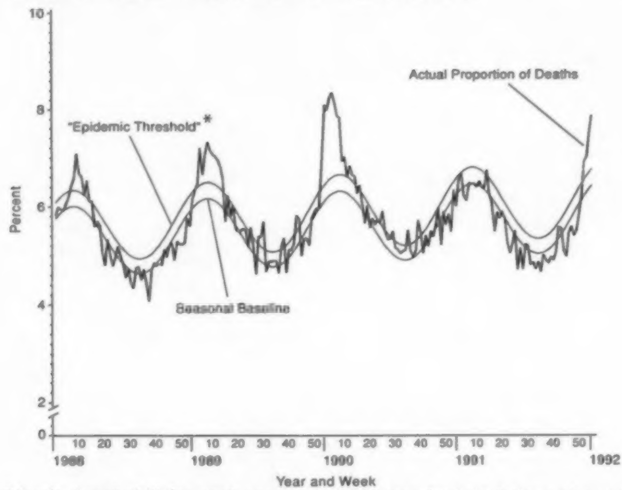
*Reflects the maximum level reported for any state during any single week from October 1, 1991 through January 18, 1992.

Influenza Activity – Continued

Of the influenza A(H3N2) viruses characterized at the WHO Collaborating Center for Influenza at CDC, 98% were antigenically closely related to the A/Beijing/353/89(H3N2) vaccine strain. Of the 33 strains of influenza A(H1N1) antigenically characterized at CDC, 23 (70%) were similar to the A/Taiwan/1/86 vaccine strain; however, 10 (30%) were similar to an antigenic variant represented by A/Texas/36/91 that is less inhibited by either antiserum to A/Taiwan/1/86 or antiserum to other related influenza A(H1N1) viruses (e.g., A/Sichuan/4/88) (Table 1). Influenza A/Texas/36/91-like viruses were isolated in the New England, Middle Atlantic, West North Central, West South Central, Mountain, and Pacific regions.

Nationally, the percentage of patient visits to sentinel physicians attributed to influenza-like illness increased steadily from a baseline of ≤2% of all office visits

FIGURE 2. Percentage of all deaths attributable to pneumonia and influenza in 121 cities — United States, January 2, 1988–January 18, 1992



*The "epidemic threshold" for each season is 1.645 standard deviations above the seasonal baseline calculated using a periodic regression model applied to observed percentages since 1983. This baseline was calculated using a robust regression procedure.

TABLE 1. Hemagglutination-inhibition titers of influenza A(H1N1) viruses with serum specimens from infected ferrets*

	Ferret antiserum		
Reference antigen	**A/Taiwan/1/86**	**A/Sichuan/4/88**	**A/Texas/36/91**
A/Taiwan/1/86	**2560**	320	320
A/Sichuan/4/88	1280	**1280**	320
A/Texas/36/91	640	40	**640**

*A fourfold difference in titer of a serum with two viruses is normally indicative of an experimentally significant variation between the viruses. In some cases, only asymmetric differences are seen when several variants are simultaneously tested.

Influenza Activity – Continued

before October 19 to a sustained peak of 8%–10% from December 7 through January 4, then declined to 6%–7% of visits during the next 2 weeks.

Through January 18, all outbreaks among adults were reported from regions where 63%–100% of subtyped influenza isolates were A(H3N2) and were associated with either influenza A(H3N2) or influenza A (not subtyped). The only confirmed outbreak of influenza A(H1N1) was reported at a school in the South Atlantic region, where 58% of all subtyped influenza A viruses were A(H1N1).

Reported by: Epidemiology Activity, Biometrics Activity, Office of the Director, and WHO Collaborating Center for Surveillance, Epidemiology, and Control of Influenza, Influenza Br, Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases; Div of Surveillance and Epidemiology, Epidemiology Program Office, CDC.

Editorial Note: For the 1991–92 influenza season, sustained reporting of regional and widespread influenza activity began earlier than any time during the previous five influenza seasons (regionally, 2–7 weeks earlier, and widespread, 5–9 weeks earlier) (CDC, unpublished data, 1986–1992). Except during the 1990–91 season, when influenza B viruses dominated, an excess proportion of deaths attributed to pneumonia and influenza occurred during the five previous seasons. For the 1991–92 season, excess influenza-associated mortality was first evident during the last week of December, 1–8 weeks earlier than for the previous five seasons.

The Immunization Practices Advisory Committee recommends that vaccine continue to be offered to both children and adults at high risk for complications of influenza after influenza virus activity is documented in the community (*2*). The predominance of influenza A among circulating viruses indicates that amantadine is a reasonable option for prophylaxis of these vaccinees during the 2-week, postvaccination period while immunity develops.

Summaries of the rapidly changing national influenza surveillance data are updated weekly throughout the influenza season and are available by computer to subscribers to the Public Health Network and to the public through the CDC Voice Information System, telephone (404) 332-4555.

References

1. CDC. Update: influenza activity—United States, 1991–92. MMWR 1991;40:809–10.
2. ACIP. Prevention and control of influenza: recommendation of the Immunization Practices Advisory Committee (ACIP). MMWR 1991;40(no. RR-6).

Epidemiologic Notes and Reports

Pulmonary Fibrosis Associated with Occupational Exposure to Hard Metal at a Metal-Coating Plant – Connecticut, 1989

On July 21, 1989, a 35-year-old worker in an industrial plant was examined at a university-based occupational health clinic (OHC) in Connecticut because of a 21-month history of shortness of breath and interstitial abnormalities visible on chest radiograph. In addition, examination of an open-lung biopsy performed in June 1989 had shown interstitial fibrosis and the presence of numerous macrophages and multinucleated giant cells in the alveolar spaces. The clinical and pathologic findings were compatible with a diagnosis of hard-metal pulmonary disease, a condition associated with occupational exposure to metallic alloys of cobalt and tungsten carbide. An energy-dispersive radiographic analysis of the biopsy material identified particulate iron, potassium, calcium, zinc, and lesser amounts of other metals in the lung tissues, but cobalt and tungsten were not specifically identified. Based on these findings, the OHC initiated an investigation to determine the source of exposure.

Pulmonary Fibrosis — Continued

The patient was employed as a helper in a detonation-gun coating process that used heated, aerosolized metal powder to coat premanufactured metal parts within an enclosed chamber; except for 12 months during 1982–1983, he had worked continuously on the process from 1981 through 1989. His duties included setting up the metal parts to be coated in an enclosed, well-ventilated chamber and then reentering the chamber after the coating process was completed to remove the finished parts. A review of information provided by his employers confirmed that powdered hard metal (tungsten carbide mixed with cobalt) was used routinely in the coating process.

During the period the process helper was employed at the plant, exposure levels for cobalt were measured routinely as part of the plant's industrial hygiene program. Although the patient had never been monitored directly, personal breathing-zone exposures measured for other workers in his department had not exceeded 100 $\mu g/m^3$ (as an 8-hour, time-weighted average), the then-applicable Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) for cobalt. However, cobalt concentrations within the coating chamber were not measured during process operation and probably exceeded this level. At the conclusion of the coating process, the chamber was thoroughly ventilated before the helper reentered it to remove the completed parts.

In 1988, a supervisor for the same coating-process department at the plant had died of a progressive, diffuse pulmonary fibrosis that was clinically and histopathologically diagnosed as hard-metal pulmonary disease. During 1984, a transbronchial lung biopsy had shown findings consistent with, but not specific for, hard-metal pulmonary fibrosis, including interstitial fibrosis with honeycombing, mononuclear cells, intraalveolar giant cells, and an increased number of alveolar macrophages. His exposure to hard metal may have occurred during earlier employment as a grinder of completed metal parts and/or while he supervised the detonation-gun coating process. As part of the OHC investigation, reexamination of biopsy materials confirmed the presence of large quantities of tungsten and lesser amounts of cobalt in his lung tissue.

An OSHA plant inspection conducted after the diagnosis of pulmonary fibrosis in the process helper documented one airborne cobalt level at 90% of the OSHA PEL. As a result of these two cases and the investigation findings reported here, the plant reviewed its industrial hygiene program for the metal-coating process and instituted a chest radiograph surveillance program for the approximately 40 coating-process employees.

Reported by: WS Beckett, MD, S Figueroa, MD, B Gerstenhaber, MD, L Welch, MD, D Klimstra, MD, GJ Walker Smith, MD, Dept of Internal Medicine, Pathology, and Epidemiology, Dept of Public Health, Yale Univ School of Medicine, New Haven, Connecticut. Div of Respiratory Disease Studies, National Institute for Occupational Safety and Health, CDC.

Editorial Note: Exposure to respirable cobalt dust (particle size <10 μm) has been recognized as a cause of respiratory disease since 1940, when illness occurred in industrial workers exposed to dust generated by metallurgic processes (*1*). Exposure to cobalt most commonly occurs during the production or use of hard metal, an extremely durable alloy of cobalt and tungsten carbide. A recent case series in the United States emphasized the spectrum of respiratory diseases associated with exposure to hard metal, including reversible airway obstruction, reversible hypersensitivity pneumonitis or alveolitis, and pulmonary fibrosis (*2*). Giant-cell interstitial pneumonia is a particular form of pulmonary fibrosis that, in an occupational setting, is believed to be highly specific for cobalt-induced disease (*3*).

Pulmonary Fibrosis — Continued

Detonation welding—the metal-coating process by which the two employees in this report were exposed—has not previously been associated with hard-metal disease. This process and the allied process of plasma coating are widely used in industry to produce smooth, durable surface coatings by the generation and deposition of high volumes of finely divided metal aerosols; these processes can, at the same time, constitute potential respiratory hazards.

Exposure-response relations in hard-metal respiratory disease are complex. For example, in one survey of hard-metal production facilities, although the overall prevalence of interstitial lung disease among exposed active workers was low (0.7%), 10% had work-related manifestations of obstructive airway disease (*4*). Furthermore, the presence of interstitial disease was not strongly correlated with measured exposure levels, suggesting that susceptibility factors other than total dose are important in the causation of disease. It is not known whether the recently adopted OSHA PEL of 50 $\mu g/m^3$ (*5*) prevents sensitization or protects persons who have become hypersensitive.

The failure to identify tungsten in the lung biopsy of the process helper is noteworthy. Because cobalt has a relatively high biological solubility, it often may not be detected in lung biopsy specimens obtained from workers with documented hard-metal disease; however, tungsten generally is present. The absence of tungsten in this case may be related to the character of the exposures associated with the specific process reported here; this process generates an unusually fine and highly heated aerosol characterized by particles that may be cleared more rapidly from the lung interstitium.

The diagnosis of hard-metal disease in these two workers is an example of an occupational sentinel health event (i.e., a condition that indicates both the failure to protect the affected worker from a preventable occupational illness and the existence of risk for similar illnesses for co-workers) (*6,7*) and indicates the occurrence of potentially fatal toxic exposures in a process previously considered to have adequate engineering controls. The episode also emphasizes the need for medical surveillance and a review of workplace practices in facilities that use cobalt in similar processes. Surveillance for the respiratory effects of cobalt may require a review of symptoms, spirometry, measurement of diffusing capacity, and chest radiographs.

References

1. Jobs H, Ballhausen C. Powder metallurgy as a source of dust from the medical and technical standpoint [German]. Vertrauensartz Krankenkasse 1940;8:142–8.
2. Cugell DW, Morgan WKC, Perkins DG, Rubin A. The respiratory effects of cobalt. Arch Intern Med 1990;150:177–83.
3. Abraham JL. Lung pathology in 22 cases of giant cell interstitial pneumonia (GIP) suggest GIP is pathognomonic for cobalt (hard metal) disease [Abstract]. Chest 1987;91:312.
4. Sprince NL, Oliver LC, Eisen EA, Greene RE, Chamberlin RI. Cobalt exposure and lung disease in tungsten carbide production: a cross-sectional study of current workers. Am Rev Respir Dis 1988;138:1220–6.
5. Office of the Federal Register. Code of federal regulations: occupational safety and health standards. Subpart Z: Air contaminants—permissible exposure limits. Table Z-1-A. Washington, DC: Office of the Federal Register, National Archives and Records Administration, 1989. (29 CFR § 1910.1000).
6. Rutstein DD, Mullan RJ, Frazier TM, Halperin WE, Melius JM, Sestito JP. Sentinel health events (occupational): a basis for physician recognition and public health surveillance. Am J Public Health 1983;73:1054–61.
7. Mullan RJ, Murthy LI. Occupational sentinel health events: an up-dated list for physician recognition and public health surveillance. Am J Ind Med 1991;19:775–99.

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